

REMARKS/ARGUMENTS

As of the Office Action mailed March 1, 2005, claims 1-5 are pending with claims 1-5 standing rejected. Reexamination and reconsideration of the application as amended, and in view of the remarks herein, is respectfully requested.

Rejections under 35 USC § 112

The Examiner has rejected claims 1-5 under 35 USC § 112 as being indefinite for “failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.” The Examiner believed that the language of claims 1 and 5, “said silyl group is present at an average functionality in the range of 1.0-6.0” caused confusion because it was not clear as to whether the oligomeric or polymeric resin had an average silyl group functionality of 1.0-6.0 or the silyl group had an average hydrolysable group functionality of 1.0-6.0. This rejection, in view of the current amendments and remarks made herein, is believed overcome for the following reasons.

The specification (page 2, [0006]) states “the average silyl functionality on said oligomer or polymer resin is 1.0, and in the range of 1.0-6.0” to indicate that it is the oligomeric or polymeric resin which has the indicated number of silyl groups on or within the chain. It stands to reason that this is necessarily the case since, as the Examiner may appreciate, silicon itself has a valence of 4. It is hopefully clear now to the Examiner regarding the meaning of the phrase the average silyl functionality on said oligomer or polymer resin is in the range of 1.0 – 6.0, and that the outstanding rejection under 35 USC § 112 will be withdrawn.

Claims 1 and 5 have been amended to recite, in pertinent part, “wherein said reaction product has average silyl group functionality in the range of 1.0-6.0” and “an oligomeric or

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polymeric resin having average silyl group functionality in the range of 1.0-6.0", respectively. Further, in dependent claims 2 and 3, "said functionality" should no longer cause confusion in view of the amendment to claim 1, as the word "functionality" clearly refers to the number of silyl groups on the oligomeric or polymeric resin and not to the number of hydrolysable groups on a silyl group.

It is believed that currently amended claims 1 and 5, and claims 2-4 depending upon claim 1, distinctly claim the subject matter which the Applicant regards as the invention. Applicant respectfully requests that rejections under 35 USC § 112 be withdrawn in view of the amendments and remarks made herein.

Rejections under 35 USC § 102

The Examiner has rejected claims 1-5 under 35 USC § 102 as being anticipated by Bahadur (US 6,258,878). These rejections, in view of the amendments and remarks made herein, are believed to have been overcome for the following reasons.

The disclosure of Bahadur is limited to a one-part moisture curable composition consisting essentially of components (A), (B), and (C), wherein component (A) is explicitly limited to a **saturated hydrocarbon polymer**. The Examiner may appreciate that a saturated hydrocarbon polymer is any chemical compound that has no double or triple bonds and only carbon and hydrogen atoms. Bahadur does not disclose or suggest that oligomeric or polymeric resins other than saturated hydrocarbons may have utility in a one-part moisture curable composition.

Claim 1 has been amended to recite oligomeric or polymeric resins not disclosed or suggested by Bahadur. Specifically, Claim 1 as amended recites, in pertinent part, "wherein said oligomeric or polymeric resin is selected from the group consisting of polyester, polyether,

polyol, epoxy, urethane prepolymer, polyisocyanate, acrylic, aminoplastic, furan, phenolic, polyvinyl butryal, silicone, and any combination thereof.” Such resins are not at all obvious from nor would they follow from the limited teaching that silyl functionality is only suitable for grafting in a stable manner onto a hydrocarbon chain (Bahadur). Accordingly, Applicant believes amended claim 1, and claims 2-4 depending upon claim 1, are not anticipated or rendered obvious by Bahadur and respectfully request the rejections against claims 1-4 in view of Bahadur are withdrawn upon reconsideration.

The Applicant would like to address the rejection of claim 5 under 35 USC § 102 in view of Bahadur. As previously discussed, the disclosure of Bahadur is limited to a composition consisting essentially of components (A), (B), and (C). For the Examiner's convenience, components (A), (B), and (C) are reproduced below:

- (A) 100 parts by weight of a saturated hydrocarbon polymer having on average at least 1.5 hydrolyzable silyl groups in its molecule;
- (B) **10 to 300 parts by weight of a silicon-free conduit compound** having at least one C6 to C30 hydrocarbon group in its molecule selected from the group consisting of esters, ethers, epoxy-containing compounds, anhydrides and ketones; and
- (C) a sufficient amount of a silanol condensation catalyst to cure said composition upon exposure to moisture.

Bahadur does not disclose or suggest that component (B), a silicon-free conduit compound, may be omitted from the composition. Rather, Bahadur discloses that such a conduit compound has significant functionality in regards to achieving a deep cure of a silylated hydrocarbon polymer. In view of the above observations, claim 5 has been amended to recite, in pertinent part, “a one-part moisture curable composition **consisting essentially of** an organometallic catalyst and an oligomeric or polymeric resin having average silyl group functionality in the range of 1.0-6.0”. The language “consisting essentially of” emphasizes that the method of claim 5 is limited to a

composition that excludes those ingredients that would materially alter the nature of the claimed invention.

In column 3, beginning on line 1, Bahadur defines and discloses the functionality of the silicon-free conduit compound, reproduced below for the Examiner's convenience.

"By definition, such a conduit facilitates the transport of water to the interior of the composition where it can react with hydrolyzable groups on the polymer to provide deep-section cure in a one-part system. The conduit materials contemplated herein do not react into the polymer network and, therefore, continue to facilitate water transport as the crosslinking reaction progresses to provide a rapid, deep cure. Additionally, because they do not contain silicones, they do not reduce the paintability of the cured compositions and do not stain substrates. Finally, the instant conduit materials allow the formulation of a one-part moisture-curable system which is relatively storage stable with respect to rapid deep-section cure capability as well as with respect to phase separation of the conduit."

In column 6, beginning on line 23, Bahadur further emphasizes the necessity of a conduit compound to achieve a deep cure of a sited hydrocarbon polymer, disclosing, "[i]f fewer than 10 parts of the conduit compound are used for each 100 parts of the polymer, the desired deep-section cure is not attained." Bahadur discloses in Example 3, Tables 5A to 5D, "it can be observed that the increased CID [Cure-in-Depth] values are attributable to the use of conduit materials of the invention".

It should be clear that the addition of a conduit compound to a composition of components (A) and (C) materially alters the properties of the sited hydrocarbon polymer composition. It should also be clear that the conduit compound disclosed in the art is necessary for complete curing of the particular saturated hydrocarbon disclosed in the U.S. '878 patent. In view of the above observations and the current amendment to claim 5, it is believed that Bahadur did not anticipate the present invention. Applicant respectfully requests the rejection against claim 5 in view of Bahadur is withdrawn upon reconsideration.

The Examiner also rejected claims 1-4 under 35 USC § 102 as being anticipated by Waldman (US 6,001,946). These rejections, in view of the amendments and remarks made herein, are believed to have been overcome for the following reasons.

Waldman discloses a composition of matter which is the product of reacting (A) a prepolymer obtained by reacting a polyol component with an excess of an isocyanate component selected from the group consisting of polyisocyanate compounds and mixtures thereof so that said prepolymer contains unreacted isocyanate groups with (B) a silane of the formula (1).

The polyurethane polymer of (A) is reacted with the organofunctional silane (B) to endcap the polyurethane polymer to provide a one-part cure upon exposure to moisture. The organofunctional silane depicted in formula (1) is a member of the class of N-silylalkyl aspartic acid esters and is produced by reaction of a primary amine and unsaturated maleate diester. As the Examiner may appreciate, the primary amine disclosed by Waldman, $\text{H}_2\text{N}-\text{T}_1-\text{X}_b-\text{Q}_q-$
 $\text{Si}(\text{R}^3)_a(\text{R}^4)_{3-a}$, is an organofunctional silane. Hence, Waldman discloses reacting an organofunctional silane with an unsaturated maleate diester to produce an organofunctional silane with diester functionality, i.e. N-silylalkyl aspartic acid ester.

According to the disclosure of Waldman, reacting the organofunctional silane with an unsaturated maleate diester prior to the silation of the polyurethane materially alters the physical properties of the final cured product. Waldman discloses in the abstract that "sealant formulations incorporating the dibutyl or diethyl maleate/primary aminoalkyl silane terminated polymers demonstrate unexpected improvements in both elongation and tensile strength performance. The dibutyl maleate and dimethyl maleate based polymers give significant increase in tear resistance." Further, Waldman discloses in column 1, lines 60-67, "it is an object of the present invention to provide compositions useful for instance as sealants, coatings, and the

like, based upon urethane prepolymers, end-capped with certain N-alkoxysilylalkyl aspartic acid esters, wherein the compositions upon curing form a product having superior elongation, tensile strength and tear resistance in comparison to formulations based on other N-alkoxysilylalkyl aspartic acid ester end-capped polymers.”

The present invention does not require the organofunctional silane to be reacted with an unsaturated maleate diester prior to silation of the polymer. Thus, the organofunctional silane used in the present invention is not represented by the general formula (1) as disclosed by Waldman. This is advantageous in that it eliminates a process step, thereby reducing the time and cost to silate the polymer. Additionally, as the Examiner may appreciate, the “physical property improvements” of Waldman’s invention may not be appropriate in all applications.

It should be clear that the organofunctional silane disclosed by Waldman relies upon the aspartic acid diester functionality to achieve the physical properties of the cured product and therefore the object of the invention of Waldman. In view of the above, Applicant has amended claim 1 to recite, in pertinent part, “comprising an organometallic catalyst and the reaction product of an oligomeric or polymeric resin with an organofunctional silane **consisting essentially of** one or more silicon-bonded hydrolysable groups”. The language “consisting essentially of” emphasizes that the composition of claim 1 is limited to an organofunctional silane that excludes functionality, such as aspartic acid diester functionality, that would materially alter the nature of the claimed invention.

In view of the above observations and the current amendment to claim 1, it is believed that Waldman did not anticipate or render obvious the subject matter of claim 1. Similarly, it is believed that Waldman did not anticipate or render obvious the subject matter of claims 2-4

depending upon claim 1. Applicants respectfully request the rejection against claims 1-4 in view of Waldman is withdrawn upon reconsideration.

Rejections under 35 USC § 103

The Examiner rejected claim 5 under 35 USC § 103 as being unpatentable over Waldman. In making this rejection the Examiner relied upon Waldman's disclosure of a curable formulation and method for coating a substrate. The Examiner believed "...it would have been obvious to one of ordinary skill in the art at the time of the invention was made to use a container for preparing the formulation."

As previously discussed, the object of the invention of Waldman requires the organofunctional silane to be reacted with an unsaturated maleate diester prior to polymer silation to achieve particular physical properties identified as "improved" by Waldman. This imparts a functionality to the organofunctional silane which is not characteristic of the present invention. Claim 5 has thus been amended to distinguish the organofunctional silane of the present invention from that of Waldman. Amended claim 5 recites, in pertinent part, "wherein silation of said oligomeric or polymeric resin occurs by the reaction of an oligomeric or polymeric resin and an organofunctional silane **consisting essentially of** one or more silicon-bonded hydrolysable groups". Similar to previously discussed amendment to claim 1, the language "consisting essentially of" emphasizes that the composition of claim 5 is limited to an organofunctional silane that excludes functionality, such as aspartic acid diester functionality, that would materially alter the nature of the claimed invention.

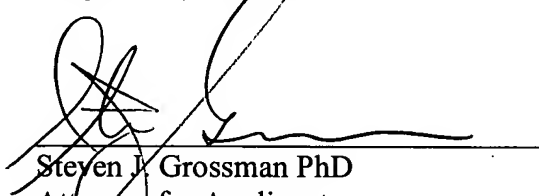
In view of the above observations and the current amendment to claim 5, it is believed that claim 5 is patentable. Applicant respectfully requests the rejection against claim 5 in view of Waldman is withdrawn upon reconsideration.

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Having overcome all of the outstanding rejections, it is respectfully submitted that the application is now in condition for allowance. In addition, to the extent that the Examiner may wish to discuss the case, the Examiner is certainly invited to contact the undersigned at the Examiner's convenience. As the Examiner may also expect, early and favorable action is respectfully solicited.

In the event there are any fee deficiencies or additional fees are payable, please charge them (or credit any overpayment) to our Deposit Account No. 50-2121.

Respectfully submitted,



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CERTIFICATE OF MAILING

I hereby certify that this paper and the papers listed thereon are being deposited with the United States Postal Service as first class mail in an envelope addressed to MAIL STOP AMENDMENT, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on August 29, 2005, at Manchester, New Hampshire.

Signature of person mailing: Carol McClelland

Name of person mailing: Carol McClelland